(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
17 July 2003 (17.07.2003)

PCT

(10) International Publication Number
WO 03/058553 A2

(51) International Patent Classification[7]: G06T

(21) International Application Number: PCT/US02/40641

(22) International Filing Date:
18 December 2002 (18.12.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/343,975 27 December 2001 (27.12.2001) US

(71) Applicant *(for all designated States except US)*: **THE GOVERNMENT OF THE UNITED STATES OF AMERICA, as represented by THE SECRETARY OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES** [US/US]; 6011 Executive Boulevard, Suite 325, Rockville, MD 20852 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **IORDANESCU, Gheorghe** [RO/US]; 5531 Halpine Place, #102, Rockville, MD 20851 (US). **SUMMERS, Ronald** [US/US]; 10935 Bells Ridge Dr., Potomac, MD 20854 (US). **CEBRAL, Juan, Raul** [AR/US]; 1701 Tyvale Ct., Vienna, VA 22182 (US).

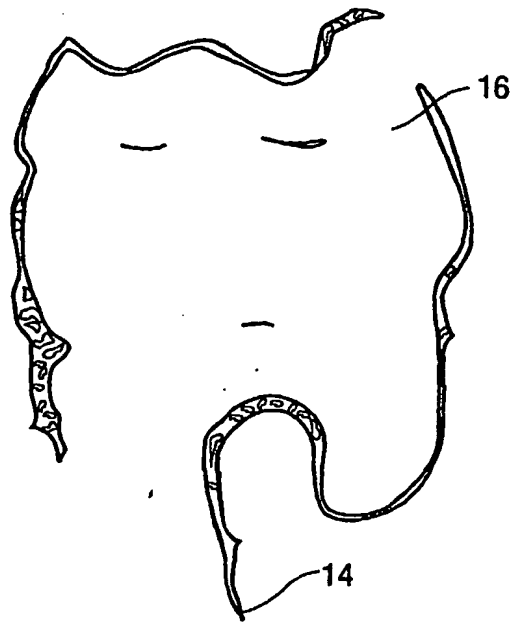
(74) Agents: **HYNES, William, M.** et al.; Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th Floor, San Francisco, CA 94111-3834 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

*[Continued on next page]*

(54) Title: AUTOMATED CENTERLINE DETECTION ALGORITHM FOR COLON-LIKE 3D SURFACES




Shrunken 3d surface of the human colon
(Number of iterations = 250)

(57) Abstract: A three dimensional image of the colon like surface is processed to determine at least its ring structure. The image is composed of vertex points, each vertex point having a discrete point identifier and three dimensional position information. The three dimensional position information is averaged in a shrinking procedure to contract the three dimensional image proximate to a major axis of the colon-like surface. Evenly spaced points are taken through the shrunken colon like surface and connected to form a curve. Planes are generated at intervals normal to the curve to split the shrunken colon like surface into image segments. By mapping these image segments back to the original image through their discrete point identifiers, an accurate ring profile of the colon like surface can be generated.

WO 03/058553 A2